

REVISED VERSION

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
31 December 2003 (31.12.2003)

PCT

(10) International Publication Number
WO 2004/000454 A1

(51) International Patent Classification⁷: **B01J 20/00**,
21/04, 23/00, 23/40, 23/42, 23/44

(US). EMILY, Jarvis, A. [US/US]; 2500 Clarendon Boulevard #315, Arlington, VA 22201 (US).

(21) International Application Number:
PCT/US2003/018857

(74) Agent: **OLDENKAMP, David, J.**; Shapiro & Dupont LLP, Suite 700, 233 Wilshire Boulevard, Santa Monica, CA 90401 (US).

(22) International Filing Date: 12 June 2003 (12.06.2003)

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/390,360 20 June 2002 (20.06.2002) US

(71) Applicant (*for all designated States except US*): **THE REGENTS OF THE UNIVERSITY OF CALIFORNIA** [US/US]; 1111 Franklin Street, 12th floor, Oakland, CA 94607-5200 (US).

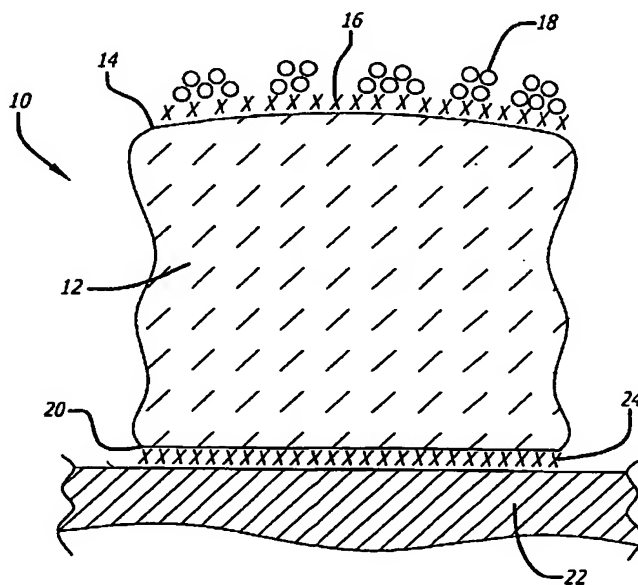
(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **CARTER, Emily, A.** [US/US]; 1017 Lindenwood Lane, Los Angeles, CA 90049

[Continued on next page]

(54) Title: SUPPORTED METAL CATALYST WITH IMPROVED THERMAL STABILITY



(57) Abstract: Catalytic systems are provided that include a metallic catalyst attached to a ceramic support that has alumina as a principal ingredient. The ceramic support is doped with an adhesive agent so that the surface of the support includes the adhesive agent. The adhesive agent is designed to form an open-shell electronic structure at the interface between the metallic catalyst and the support. The open-shell structure promotes extended useful catalyst lifetimes. The adhesive agents are early transition metals that include titanium, zirconium, scandium, hafnium, lanthanum and yttrium. Doping of the ceramic support surface with the adhesive agent also increases the adhesion between the ceramic support and metallic monoliths to which the ceramic support may be attached.

WO 2004/000454 A1